IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group:	3632
Confirmation No.:	6209
Application No.:	10/614,740
Invention:	Utility Pole Cross-Arm and Associated Pole-Top Hardware
Applicant:	Kralic, John Frank
Filed:	July 8, 2003
Attorney Docket:	201144.00001
Examiner:	Wujciak, Alfred J.

DECLARATION OF DR. JAIME DE LA REE

I, Dr. Jaime De La Ree, do hereby state under penalty of perjury:

1. My name is Jaime De La Ree. I am presently Associate Professor and Assistant Department Head at Virginia Polytechnic Institute and State University in the Department of Electrical and Computer Engineering.

2. I received a degree of M.S.E.E. from the University of Pittsburgh in 1981, and a Ph.D. from the University of Pittsburgh in 1984. In 1984, I joined the faculty of Virginia Polytechnic Institute and State University, Department of Electrical and Computer Engineering, as Assistant Professor and in 1990, I was promoted to Associate Professor. In 2004, I became Assistant Department Head of the Electrical and Computer Engineering Department. Attached hereto is a curriculum vitae fully setting forth my professional career in detail.

3. My specialty has been power systems and power system protection. I am a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) and a member of the Power System Relaying Committee of IEEE. I have developed the Power System Research Laboratory and the Power System Protection/Measurement Laboratory both at Virginia Tech. The principal topic of my research throughout my career has been power systems and power system protection, which includes power distribution systems. I have also authored and co-authored 25 journal papers, most focused on electrical power systems.

4. I have reviewed U.S. Application No. 10/614,740, published as U.S. 2004/0084582 on May 6, 2004. The subject matter is directed to a cross-arm for a utility pole for use in low to medium voltage electricity distribution and transmission. The cross-arm is metallic and coated with an insulatory coating, such as a polymeric material. The polymeric material may be applied by an electrolytic powder coating process, using a powder of the polymeric material. The polymeric material may alternatively be a nylon, a thermoplastic or an epoxy.

5. Over the years, cross-arms for utility poles for use in low to medium voltage electricity distribution and transmission have been made of wood, primarily because of the risk of electrocution to birds and other animals that may encounter the cross-arm of utility poles. Electrocution of birds has been of particular focus because of the risk of causing fires and electrical outages that can result. For that reason, elaborate mechanisms and systems have been designed and used to try to avoid birds sitting on the cross-arms of utility poles used in low to medium voltage electricity distribution and transmission, and to otherwise avoid the birds perching on the cross-arms of utility poles. *See*, for example, *Suggested Practices for Raptor Protection on Power Lines: the state of the art in 1996.*

6. In view of the history in the art, the cross-arm for a utility pole for use in low to medium voltage electricity distribution and transmission claimed in the Application No. 10/614,740 was not obvious in 2002 in view of the art of which I am aware.

7. I have been particularly asked to consider U.S. Patent 6,142,434 to Trost et al. and the English translation of JP Application H11-210271 to Sagawa et al., and to provide my opinion based on my experience whether the disclosures of the '434 patent and the JP '271 application provide the evidence that the cross-arm described and claimed in Application No. 10/614,740 was obvious in 2002. I can state categorically that the information in those two patents does not show that the utility pole described and claimed in the '740 patent application was obvious to one skilled in the art.

8. The Trost '434 patent only discloses a multi-purpose utility pole with a clamp mechanism rather than a traditional through-bolt fastening mechanism. A traditional cross-arm is shown indicating that it is made of wood.

9. Sagawa '271 is a "BEAM PIPE MOUNTING STRUCTURE" and is especially useful"in protective fences, especially in locations such as walkways in public parks." Sagawa JP '271 application discloses a pipe beam mounting structure [that] comprises loosely inserting the end of a beam pipe 20 into a mounting hole 11 disposed on the side of a tubular post 10 leaving a gap, and driving a wedge-shaped pipe anchorage device 30 having a side 31 capable of closing the majority of the gap 12 and anti-slip projections 32 into this gap. In particular, the wedge-shaped pipe anchorage device 30 comprises a plastic molded compact, and the tubular post 10 and the beam pipe 20 comprise plastic coated metal pipes with an imitation wood. Translation at 1. Sagawa '271 discloses nothing to do with utility poles, utility pole cross-arms or power transmission lines of any kind, or otherwise presents any material of interest in solving the problem addressed by the '740 application.

10. I have also been asked to consider U.S. Patent Nos. 3,803,570 to Barlow et al., 6,146,576 to Blackmore, 6,464,196 to Crookham et al., U.S. Published Application No. 2004/0035602 to White, and UK Patent Application 2,384,223 to Lowson alone or in combination with U.S. Patent 6,142,434 to Trost et al. and the English translation of JP Application H11-210271 to Sagawa et al.

11. U.S. Patent No. 3,803,570 to Barlow et al. teaches a moisture indicating system having a probe 16 made from metal rod 28 having an insulating sleeve and a pointed metal tip 32 that is pressed into the earth. *Id.* at col.3, ll. 23-30. A dielectric clement is positioned between the metal rod 28 and the metal tip 32 to create a capacitor when the probe is in the ground. The probe 16 is insulated so that the dielectric element positioned between the metal rod 28 and the metal tip 32 enables "a series-connected variable capacitor and resistor path to the ground...." I have considered the '570 patent, and the '570 patent does not teach anything related to the problems encountered with cross-arms for a utility pole for use in low to medium voltage electricity distribution and transmission. The '570 patent does not provide any additional information to fill the above described deficiencies of the Trost '434 patent and the Sagawa '271 application in relation to Claims 29 and 37 of the '740 application.

12. U.S. Patent No. 6,146,576 to Blackmore discloses a composite material impregnated with heat curable resin. U.S. Patent No. 6,146,576, col. 1, ll. 11-13. The composite material in the '576 patent may be impregnated with epoxy. I have considered the '576 patent, and the '576 patent does not teach anything related to the problems encountered with cross-arms for a utility pole for use in low to medium voltage electricity distribution and transmission. The '576 patent does not provide any additional information to fill the above described deficiencies of

the Trost '434 patent and the Sagawa '271 application in relation to Claims 33, 35, and 51 of the '740 application.

13. U.S. Patent No. 6,464,196 to Crookham et al. discloses a temporary base for a vertically extending structure. U.S. Patent No. 6,464,196, col. 1, ll. 6-9. The base of the '196 patent may support a steel pole. *Id.* at col. 7, ll. 5-6. I have considered the '196 patent, and the '196 patent does not provide any additional information to fill the above described deficiencies of the Trost '434 patent and the Sagawa '271 application in relation to Claim 54 of the '740 application.

14. U.S. Published Application No. 2004/0035602 to White discloses an adjustable aerial terminal. U.S. Published Application No. 2004/0035602, Para. [0003]. The housing of the terminal may be coated with polyurethane to withstand environmental conditions. *Id.* at Para. [0025]. I have considered the '602 application, and the '602 application does not provide any additional information to fill the above described deficiencies of the Trost '434 patent and the Sagawa '271 application in relation to Claims 32 and 52 of the '740 application.

15. UK Patent Application 2,384,223 to Lowson discloses a track for a personal rapid transport system. UK Patent Application 2,384,223, pg. 1, ll. 3-4. The '233 application teaches using a hollow, thin walled rectangular cross section for the track cross members. *Id.* at pg. 4, ll. 17-21. I have considered the '223 application, and the '223 application does not provide any additional information to fill the above described deficiencies of the Trost '434 patent and the Sagawa '271 application in relation to Claim 30 of the '740 application.

16. If one were looking in 2002 for a solution to the problem in utility pole cross-arms that has been a tradition in low to medium voltage power distribution and transmission, one would not even consider the Sagawa '271 application, alone or in combination with U.S. Patent

Nos. 3,803,570 to Barlow et al., 6,146,576 to Blackmore, 6,464,196 to Crookham et al., U.S. Published Application No. 2004/0035602 to White, or UK Patent Application 2,384,223 to Lowson.

Jaime De La Ree

Dr. Jaime De La Ree

June - 25 - 2007

Date

BIOGRAPHICAL SKETCH

Name: Jaime De La Ree
Date of Birth: December 17, 1957
Year Appointed: 1984

Degrees:

Instituto Tecnologico y de Estudios Superiores de Monterrey
Period: 1976 - 1980
Subjects: Electrical Engineering
Degree: Bachelor of Science in 1980
First Class. Top rank in graduating class of Electrical Engineering

University of Pittsburgh
Period: 1980 - 1981
Subject: Electrical Engineering
Degree: Master of Science

University of Pittsburgh
Period: 1982 - 1984
Subject: Electrical Engineering
Degree: Ph.D.

Field of Specialization:

Power Systems, Power System Protection, Elecric Machinery

Academic Employment:

Virginia Polytechnic Institute and State University
Assistant Professor from 1984 - 1990
Associate Professor from 1990 - 2004
Assistant Department Head 2004 - Present

Professional Affiliations:

Institute of Electrical and Electronics Engineers (IEEE), N.Y.

(a) **Senior Member of IEEE (1993).**
(b) **Member:** Power System Relaying Committee of IEEE

Development of Research Laboratories:

(1) Power System Research Laboratory at Virginia Tech.
This laboratory includes innovations in real-time computer simulation of synchronous generators and their control, advanced-preceise synchronized phasor measurement systems and advanced protection schemes for power systems. The advanced equipment forms the basis of student theses at Virginia Tech.

(2) Power System Protection/Measurement Laboratory, Virginia Tech:
Laboratory developed for teaching and research, consisting of modern protection/measurement equipment donated by manufacturers of electric power equipment. The laboratory is used in a regularly scheduled course, and for research sponsored by industrial sponsors.

Invited Papers and Presentations:

1. Universidad Federal de Rio Grande do Sur, Porto Alegre, Brazil
Title: Computer Relaying for Power Systems
March 2003

(1) Invited "Engineering Education Lecture" at the International Conference on Education into the Year 2000, December 1998, Monterrey, Mexico.

(2) Invited "Fault Location in Power Systems" University of Bratislava, Bratislava, Slovakia, March 1997.

Journal Articles:

1. Torque Pulsations in Synchronous Motors Under Starting Conditions, J. De La Ree, H.B. Hamilton. IEEE Industry Applications Society, Vol. IA-23, No.3, pp 512-519, May/June 1987.
2. Torque Production in Permanent Magnet Motors, J. De La Ree, N. Boules. IEEE Industry Applications Society, Vol. 25, No.1, pp 107-112, Jan/Feb 1989.
3. PC Based Real-Time Simulation for Teaching Power Engineering Concepts,J. De La Ree, J. Latorre. IEEE-PES Transactions on Power Systems, Vol. 5, No.1, pp 326-330, February 1990.
4. Performance Evaluation of PM Machines with Quasi-Square Input Currents, J. De La Ree. Electric Machines and Power Systems, Vol. 18, No.3, pp 283-291, 1990.
5. Magnet Shaping to Reduce Induced Voltage Harmonics in PM Machines with Surface Mounted Magnets, J. De La Ree, N. Boules. IEEE-PES Transactions on Power Conversion, Vol. 6, No.1, pp 155-161, March 1991.
6. Electromechanical Forces and Torque in Brushless Permanent Magnet Machines, V. Gangla, J. De La Ree. IEEE-PES Transactions on Energy Conversion, Vol. 6, No.3, pp 546-552, September 1991.
7. Induced Voltage Harmonic Reduction of PM Cylindrical Machines, J. De La Ree, N. Boules. IEEE Transactions on Industry Applications, Vol. 28, No.3, pp 619-624, May/June 1992.
8. Stability and the Transient Energy Method for the Classroom, Dr. A. LLamas, Dr. J. De La Ree, IEEE, SSST 1993, March 09, 1993, Tuscaloosa, AL.
9. Adaptive Out-of-Step Relaying Using Phasor Measurement Techniques, V. Centeno, J. De La Ree, A.G. Phadke, G. Michel, J. Murphy, R. Burnett, IEEE Computer Applications in Power, Feature Paper, Vol. 6, No. 4, pp 12-17, October 1993.
10. Implementation of Adaptive Out-of-Step Relaying with Phasor Measurement, V. Centeno, J. De La Ree, J. Benton, M. Wilhem, G. Michel, Precise Measurement in Power Systems, Arlington, VA, October 27-29, 1993.
11. Flaws In Energy Function Methods For Transient Stability Analysis Of Power Systems, A. LLamas, J. De La Ree, L. Mili, A.G. Phadke, J.S. Thorp, Precise Measurement in Power Systems, Arlington, VA, October 27-29, 1993.
12. Testing an Adaptive Out-of-Step Relay Using Real-Time EMTP Playback Techniques, S. Anderson, K.C. Kong, J. De La Ree, A.G. Phadke, Y. Liu, II Simposio Iberoamericano de Proteccion de Sistemas Electricos de Potencia, Monterrey, NL, Mexico, November 16, 1993.
13. Clarifications of the BCU Method For Transient Stability Analysis, A. LLamas, J. De La Ree, L. Mili, A.G. Phadke, J.S. Thorp, IEEE, PES, WPM-94, New York, NY, February 01, 1994.
14. V. Centeno, J. De La Ree, A. G. Phadke, G. Michel, J. Murphy, R. Burnett, "Adaptive Out-of-Step Relaying Using Phasor Measurement Techniques", IEEE Computer Applications in Power, Vol. 6, No. 4, October 1993.
15. A. Llamas, J. De La Ree Lopez, L. Mili, A. G. Phadke, J. S. Thorp, "Clarifications of the BCU Method for Transient Stability Analysis" submitted for presentation at the IEEE Winter PES Meeting, 1994.
16. J.D. McCalley, V. Ajjarapu, J. De La Ree, et. al., "PowerLearn: Module Based Multimedia Courseware Development for Power System Engineering Education," to be published in Computer Applications in Power (CAP), 1998.
17. David C. Elizondo, J. De La Ree, Arun G. Phadke, Stan Horowitz, "Hidden Failures in Protection Systems and their impact on wide-area disturbances" IEEE PES Winter Meeting Proceedings, Columbus, OH, Feb. 2001.
18. David C. Elizondo, J. De La Ree, Arun G. Phadke, Stan Horowitz, "A Methodology to Evaluate Hidden Failure Effects Based on Regions of Vulnerability in Protection Schemes of Electric Power Systems" NAPS Conference, College Station Texas, Texas A & M University, October 15-16, 2001.
19. David C. Elizondo, J. De La Ree, "Protection System Failures – Wide Area Disturbances – The Hidden Failure Analysis" Proceedings of the 12th International Conference on Power System Protection, Bled, Slovenia, September 2000
20. Jaime De La Ree, David Elizondo, Juancarlo Depablos from VT, James Stoupis from ABB An Adaptive Protection Scheme for Power Distribution Systems, Beiging, China September 2002, CRIS Conference 2002.
21. Jaime De La Ree, David Elizondo, Analysis of Hidden Failures of Protection Schemes in Large Interconnected Power Systems, Beiging, China, September 2002, CRIS Conference2002.

22. J. De La Ree, Prof. Y. Liu, Prof. L. Mili, Prof. A.G. Phadke, Prof. L. Da Silva, Virginia Tech, Catastrophic Failures in Power Sytems - Causes, Analyses, and Countermeasures - , Proceedings of the IEEE, Special Issue on the subject of "Energy Infrastructure Defense Systems", 2004.
23. Wide Area Protection and Emergency Control, Working Group Report C-6, Power Systems Relaying Committee, IEEE-2004.
24. F.M. Uriarte, V.Centeno, J.De La Ree, J. DePablos, "Continuous vs Piecewise Hysterisis Model of a Current Transformer", IEEE PRIME 2006, 11-16 June, Otrnato (Lecce), Italy.
25. State Estimation (SE) using Wide Area Information Sharing (WAIS) and Phasor Measurement Units (PMUs), Robert F. Jeffers, Jaime De La Ree, James, S. Thorp, CRIS 2006.

Indusrtial Experience

Summer 1986 – General Motors Research Labs – Development of Computer-Based Models of PM Machines

Summer 2001 – ABB – ETI Raleigh, NC. Advanced Protection for Distribution Systems.

Summer 2002 – ABB –Meter Group, Raleigh, NC. Advanced

Summer 2004 – NASA – Wallops Flight Faility – Efficient Use of Energy.